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f a c e s o f f i r e



PREVENTION • SUPPRESSION • PRESCRIBED FIRES

*How our management integration
of wildland fire prevention, suppression, and use of prescribed fire:*

- Helps ecosystem management. • Supports forest health objectives.
- Protects and enhances our country's natural resources through the safe and effective use of fire.



In the last 10 years, public attention has been gripped by the dominance of wildland fires across the American landscape. Events such as the Yellowstone fires, Oakland Hills, the tragic deaths of 32 firefighters in 1994, and the lengthy 1996 season when a record 6 million acres burned—all have captured America's attention. One thing people have noticed this past decade is that public forests and rangelands are threatened. The fact is that we do not have a fire problem. We have a fuels problem. By using all of the tools available to us—carefully thinning young dense stands of trees, using prescribed fire, controlling invasive noxious weeds, using appropriate grazing systems—we can reduce fuel levels. Of course, all of our fire management must take place within the context of first protecting human lives and property. By applying science wisely, in this case the science of wildland fire, people as well as wildlife and natural resources will benefit. The stage is set for the Forest Service to work with States, other Federal managers, and private landowners to restore healthy forests and rangelands. Recently we adopted the concept of FIRE 21, which promotes the safe and effective use of wildland fire. At the top of the FIRE 21 triangle is safety; its foundation is accountability. In the middle are all the actions needed to maintain, restore, and sustain fire-adapted public lands. The challenge of tackling wildland fires is bigger than any one agency or organization. Only through cooperation, collaboration, and integrated landscape planning with agencies and States, will we be effective in securing healthy landscapes for future generations. To achieve these benefits, we must act now. As we move forward, we will not be alone. We recognize the tremendous amount of support provided to us by our Federal, State, and tribal partners who work shoulder-to-shoulder with us during fire emergencies. Our resource management and protection partners are invaluable. We will work together in prevention, prescription, and suppression to provide the extra effort needed to protect the Nation's valuable natural resources. I hope everyone reading "Faces of Fire" will gain a better understanding of wildland fire. A balanced program of prevention, fuels reduction, and suppression, using the principles of FIRE 21, will require the effort of every individual. Nonetheless, the future of America's publicly owned natural resources and the benefits they provide depend on it.

MIKE DOMBECK

*Chief
USDA Forest Service*

A large, handwritten signature of "Mike Dombeck" in a dark brown ink. The signature is fluid and cursive, with some loops and variations in thickness.

fire helped shape our home

**"THE EARTH, BORN
IN FIRE, BAPTIZED
BY LIGHTNING,
SINCE BEFORE
LIFE'S BEGINNING,
HAS BEEN AND IS
A FIRE PLANET."**

E.V. KOMAREK



Tom Traci

Fire was here long before humans were.

In fact, for the last 400 million years the Earth has had the capacity to burn.

Lightning has ignited fires on this planet and helped stimulate life by catalyzing the Earth's earliest organic compounds. For millennia, fire proved a pervasive force for shaping ecosystems across North America.

These free-burning fires played an important role in influencing vegetation and the life cycles of trees and plant communities. Many species even became dependent on this process or "fire-adapted"—able to survive, regenerate, and thrive in a fire-prone environment.

Today, these fire-adapted forests comprise one-third of all our National Forest System (NFS) lands and half of our NFS grasslands.

Native Americans used slash and burn operations across this continent for hundreds of years before Europeans arrived. Accounts by early fur traders, explorers, Native Americans, and the first Euro-American settlers here concur that fires were set to improve rangelands for livestock and to help in hunting game. By the 1800's, fire as an agricultural tool was as common as the hoe.

There is no doubt this dynamic history of both natural and human-triggered fires that originally burned across this country helped clear the way for our modern civilization.

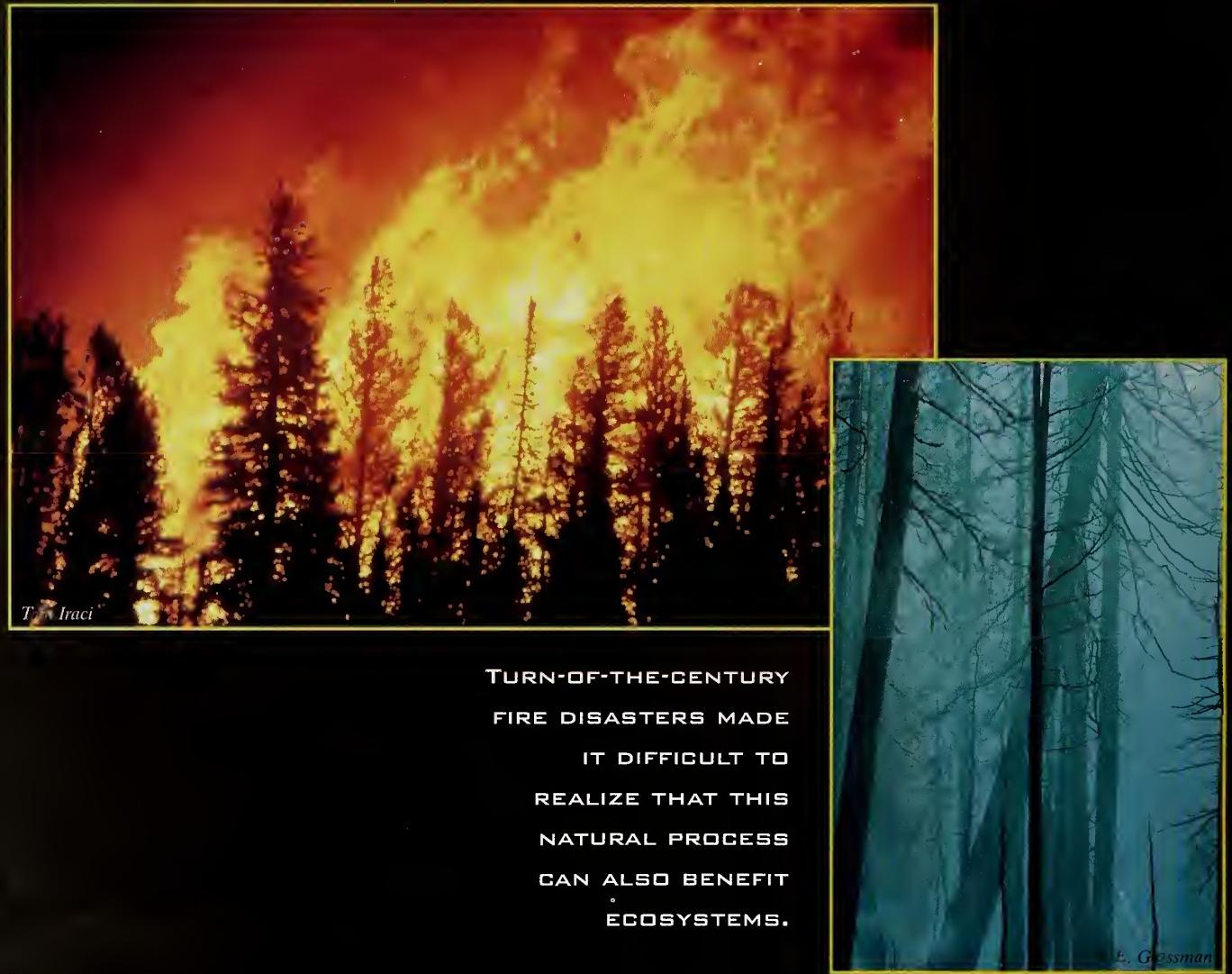
fire's reputation goes

By the beginning of this century, wildfire had earned its reputation as a notorious adversary.

For example, the 1871 Peshtigo Fire, fueled by logging slash, killed 1,500 people in Michigan and Wisconsin. The inferno burned more than 3.5 million acres. In 1910, fires in Idaho and Montana killed 80 firefighters and blackened another 3 million acres. They leveled entire towns and cost \$1 million to extinguish.

Dictated by our society's values, stringent Federal fire control policies quickly evolved.

At the same time, these early fire disasters made it difficult to recognize that fire could be anything but damaging. All fires were considered a major threat.



TURN-OF-THE-CENTURY
FIRE DISASTERS MADE
IT DIFFICULT TO
REALIZE THAT THIS
NATURAL PROCESS
CAN ALSO BENEFIT
ECOSYSTEMS.

u p i n s m o k e

SUCCESSFUL PREVENTION
AND SUPPRESSION
EFFORTS HAVE ALTERED
FIRE PATTERNS DURING
THE PAST CENTURY.



In the public's eyes, fire—the natural force that had shaped our wildlands for centuries—became the face of the enemy.

For the most part, the public didn't understand the complex and necessary role that fire serves in fire-adapted ecosystems. They didn't see fire's important ecological function. They didn't realize the many negative and enduring consequences of fire's exclusion, including: loss of fire-dependent species; insect and disease epidemics; and the paradoxical buildup of fuel (combustible carbon from trees, understory growth, etc.) that would eventually lead to even more severe and costly wildfires.

Therefore, for decades, our Nation depended on the Forest Service and other wildland fire agencies to eliminate fire from the environment. In response, we developed highly trained and effective prevention and suppression forces.

In many cases, we protected lives and property and trees—but at the expense of the forest community. Due to our successful prevention and suppression efforts, fire patterns were markedly altered during the past century.

A dramatic change in the condition of our ecosystems had begun.

**IF WE CONTINUE TO RESTRICT
FIRE'S ROLE IN ECOSYSTEMS:**

- Wildland fires will become more severe and more costly to suppress.
(Suppression efforts on a single wildfire can cost as much as \$1 million per day.)
- The risk of catastrophic wildland fire will greatly increase.
- People's lives and property will be increasingly endangered—especially within our country's popular wildland-urban interface areas.
- Our firefighters will face greater dangers.
- Water quality and fish and wildlife habitat will be impaired and will decline.
- Habitat for threatened and endangered species will be lost.
- Smoke emissions that impair air quality will increase.
- The subsequent conversion from fire-resistant species to fire-intolerant species will make ecosystems even less resilient to fire.
- Those who enjoy hunting, fishing, camping, and other recreational activities will be adversely affected.





In the absence of fire, massive insect and disease epidemics and various other forest health problems have proliferated. Millions of trees have been killed outright. Millions more are threatened. People throughout the Nation have joined our ecosystem managers in their concern over this deteriorating health of our country's lands. As recent fire seasons have shown us, fire exclusion has made our wildlands even more flammable and susceptible to severe wildland fire.

Ron Nichols

t h e f a c e o f f i r e s u p p

As a result of our success in training and preparing its fire prevention and suppression forces, the country has learned to depend upon this agency to take a leadership role in suppressing potentially harmful wildland fire.

Effective management of wildland fire in the United States, however, is becoming increasingly complex.

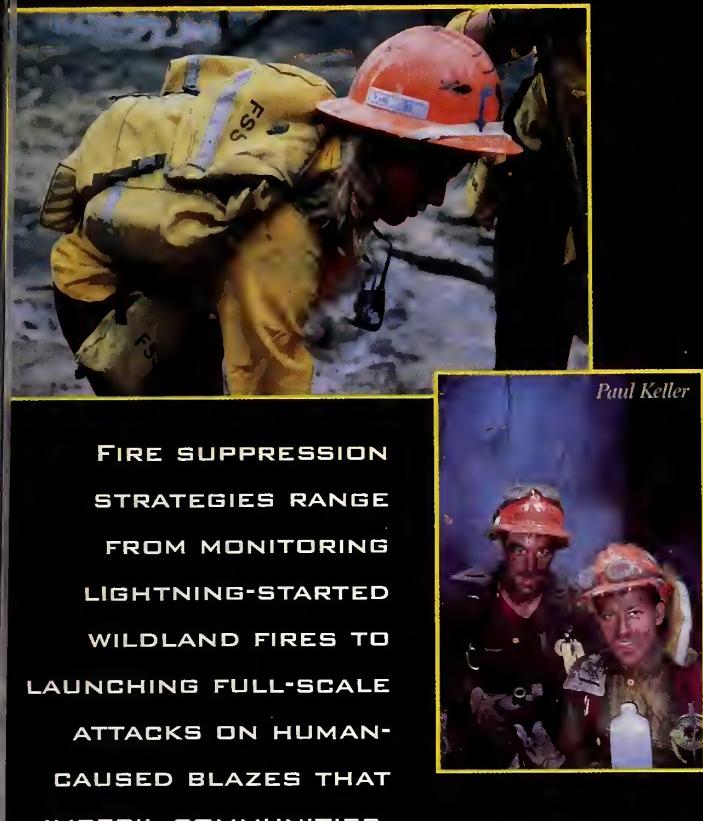
Catastrophic wildland fire now threatens millions of wildland acres. Enormous public and private values and resources are currently at risk.

A carefully managed prescribed fire is one thing. Wildland fire—when destructive, powerful, out of control, and threatening life and property—is quite another.



**UNCONTROLLED
FIRE CAN
CONTRIBUTE TO
SERIOUS
EROSION AND
FLOODING.**

re s s i o n



FIRE SUPPRESSION STRATEGIES RANGE FROM MONITORING LIGHTNING-STARTED WILDLAND FIRES TO LAUNCHING FULL-SCALE ATTACKS ON HUMAN- CAUSED BLAZES THAT IMPERIL COMMUNITIES.



FIRE'S DESTRUCTIVE IMPACTS

Uncontrolled fire can:

- Take human life.
- Burn and destroy homes and communities.
- Contribute to serious erosion and floods—washing soil and ash into streams, lakes, and community reservoirs.
- Destroy wildlife and fish and their vital habitats.
- Spoil scenic and recreational qualities and attributes.
- Damage and destroy recreation areas, roads, trails, and streams.
- Damage and destroy valuable tree-harvest areas.

Today, fire suppression strategies can range from monitoring a lightning-started wildfire in remote wilderness areas under an approved plan, to launching a full-scale attack on a human-caused blaze that imperils a community.

America's wildland firefighters are the best in the world. While their mission varies with time and place, their main goal remains the same: to protect human life, property, and our myriad natural resources.

Thanks to these courageous men and women, loss of life and damage to property and to this country's natural resources from wildfires remains low.

In fact, today, our highly trained and qualified fire suppression organization has broadened its capabilities. We now call upon its members to also help implement the critically important hazardous fuel reduction programs.

t h e f a c e o f f i r e p r e v e

Fire prevention and fire readiness and preparation activities are an integral foundation to our fire management organization. Today, we place an even greater emphasis on these proactive efforts.

For decades, fire suppression actions were the main purpose of our fire management organization. But we have realized that to truly function as an ecosystem management agency, fire management activities must begin before the fire starts.

Fire prevention has become an important strategic tool to help mitigate specific wildland fire problems. We have moved from an era in which we believed “all fires are bad—prevent fires” to a time of renewed commitment to landscape and ecosystem needs.



TO TRULY
FUNCTION AS AN
ECOSYSTEM
MANAGEMENT
AGENCY, FIRE
MANAGEMENT
ACTIVITIES MUST
BEGIN BEFORE
THE FIRE STARTS.



n t i o n

**DEVASTATING, UNPLANNED
HUMAN-CAUSED WILDLAND FIRES
MUST BE PREVENTED. THE BENEFITS
OF PRESCRIBED FIRE MUST BE
REALIZED AND ENCOURAGED.**



Brian Harris



Jim Hughes

STILL NEED TO HEED SMOKEY

Human carelessness will always be an absolutely unacceptable cause of fire. We must, therefore, continue our public education campaign to prevent these potential—and sometimes fatal—calamities.

The Smokey Bear crusade and other prevention efforts continue to help reduce this potential for devastating and destructive human-caused wildfire.

In 1941, wildland fire claimed 30 million acres in this country. Nine out of 10 of these fires were caused by people. Since the advent of Smokey Bear's fire prevention efforts, wildfires caused by humans have been reduced by half—even though 10 times as many people use our national forests today.

Unquestionably, we must now take our public education message even further. We need to convey the importance of a desired balance—avoiding fires with adverse effects while simultaneously increasing beneficial prescribed fire.

We must also place a renewed and special emphasis on education, prevention, and protection in wildland-urban interface areas.

the face of prescribed

As our understanding of fire's role in the ecosystem has grown, we have made significant revisions in our fire management policy. We now realize that frequent, often less-intense fires of ancient times were beneficial in some settings. We know it is more logical to view fire as a natural process rather than an absolute enemy.

Obviously, the wildlands of centuries past have changed. More people are now affected by fire—or lack of fire. And the various resources that our national forests provide have become extremely valuable to our society.

Within our abundant fire-adapted ecosystems, however, it is difficult to replicate the complex effects of fire by mechanical, chemical, or any other single means.

As part of our prevention and suppression efforts, an answer—an antidote—to our current forest health dilemma does exist. The third face of fire: prescribed fire.

b e f o r e

FUEL BUILD-UP AND GROUND LITTER ARE OBVIOUS TO THE EYE IN THIS STAND IN OREGON'S OCHOCO NATIONAL FOREST.

PHOTO WAS TAKEN PRIOR TO THE MILL CREEK PRESCRIBED FIRE.



f i r e

THE ISSUE IS WHETHER WE WANT CONTROL OVER THE EFFECTS OF FIRE, ITS LOCATION, AND INTENSITY. PRESCRIBED BURNING ALLOWS US THAT CONTROL. MOST OFTEN, WILDFIRES DO NOT.



THE RESULTANT MILL CREEK PRESCRIBED FIRE
CLEANSED THE AREA BY REDUCING THE CURRENT
AND FUTURE AVAILABILITY OF POTENTIALLY HARMFUL
HEAVY BUILD-UP OF FUELS—AS ILLUSTRATED IN THE
ABOVE PHOTO, TAKEN IN THE SAME LOCATION (AS
PHOTO ON LEFT) AFTER FIRE MANAGERS HAD
CONDUCTED THE PRESCRIBED FIRE.

a f t e r

Today, our fire management concept is threefold. We recognize the importance of prevention and protecting human life, property, and resources from wildfire—and taking appropriate suppression actions. And we also address the importance of prescribed fire.

Fire obviously can produce dramatic short-term changes. But its more subtle influences are most significant for maintaining healthy ecosystems. In fact, fire's primary benefits are often long term, biologically complex, and largely inconspicuous.

Consequently, it becomes difficult to truly appreciate the importance of fire.

PRESCRIBED FIRE:

- Reduces the accumulation of combustible materials.
- Recycles forest nutrients.
- Minimizes insect populations and spread of disease.
- Encourages and maintains the growth of native trees and plants best suited to fire-adapted ecosystems.
- Removes unwanted species that threaten an ecosystem's health.
- Provides better access and conditions for wildlife.
- Is used only under appropriate conditions and on appropriate sites.
- Meets specific management objectives—such as reducing wildfire potential and enhancing vegetation.
- Is carefully planned in advance—long before ignition.
- Occurs only when optimum temperature, humidity, wind speed, and fuel moisture content occur—ensuring that the fire remains inside designated boundaries and accomplishes objectives.
- Is guided by smoke management plans to minimize smoke's impact on populated areas.



EVEN AS WE LAUNCHED OUR AGGRESSIVE FIRE SUPPRESSION EFFORTS OVER THE LAST CENTURY, SOME FOREST MANAGERS OBSERVED THAT LOW-INTENSITY SURFACE FIRE—IN SOME STANDS—ACTUALLY PROVIDES BENEFITS. TODAY, PRESCRIBED BURNING HAS GAINED ITS RIGHTFUL ACCEPTANCE.



Yuen-Gi Yee

AS THE AMERICAN PUBLIC UNDERSTANDS THAT FIRE IN THE ECOSYSTEM IS A NATURAL AND REVITALIZING PROCESS, IT MUST ALSO ACCEPT THAT FIRE'S RETURN TO THE LANDSCAPE IS NOT WITHOUT CONSEQUENCE. THESE POTENTIAL OUTCOMES INCLUDE POSSIBLE HAZY SKIES, PATCHES OF A BLACKENED FOREST FOR A TIME, DISRUPTION OF RECREATIONAL ACTIVITIES, AND EVEN THE RISK OF A FIRE BECOMING LARGER THAN EXPECTED. THE FACT REMAINS, HOWEVER, THAT PRESCRIBED BURNING AND ITS TRADEOFFS WILL REMAIN NECESSARY IF WE, AS A SOCIETY, ARE TO SUSTAIN THE VALUES, PRODUCTS, AND EXPERIENCES WE DESIRE AND EXPECT FROM OUR PUBLIC LANDS.



Returning fire to the ecosystem is not a simple undertaking.

Many of our ecosystems are far more complex today than a century ago. In many cases, unprecedented changes in tree species composition and structure, fuel build-ups, alien species, insect and disease dynamics, and the tremendous growth of the wildland urban interface have been added to the complexity of our ever-changing ecosystems.

Prescribed fire must therefore be planned in specific wildland ecosystems.

Information needed to reintroduce fire includes well-planned, large-scale scientific assessment of current ecosystem conditions, as well as the consequences of various management strategies.

Prescribed fire must also be consistent with land and resource management plans, as well as approved prescribed burn plans.

can prescribed fire improve

It's an intriguing question: Can prescribed fire really help improve our air quality?

Our fire managers and fire researchers today—after ongoing research and field study—are nodding their heads "yes."

In 1994, the 65,700 wildfires that burned 3.8 million acres of Federal lands also produced millions of tons of airborne particles. Many communities were plagued with smoke pollution that far exceeded the Environmental Protection Agency's Federal air quality standards, designed to protect public health.

Indeed, a single wildfire that consumes 100 acres of heavy forest fuels can emit as much as 90 tons of particulate matter into the atmosphere.

As our forests' fuel loads and under-story biomass increase, we face an increasing potential for even higher particulate matter emissions that conflict with the Federal Clean Air Act.

"SINCE PRESCRIBED FIRES ARE IGNITED DURING WEATHER CONDITIONS THAT MINIMIZE EMISSION IMPACTS ON POPULATED AREAS AND WILDFIRES ARE NOT, THE EMISSIONS FROM WILDFIRES HAVE A GREATER CHANCE OF AFFECTING THESE AREAS THAN DO PRESCRIBED FIRES."

KEN SNELL

AIR RESOURCE MANAGER
PACIFIC NORTHWEST REGION,
USDA FOREST SERVICE



**PRESCRIBED FIRE CAN BE
IGNITED WHEN WEATHER AND
FUEL CONDITIONS ALLOW
FOR MINIMIZED SMOKE
IMPACTS ON THE PUBLIC'S
AIR QUALITY.**

v e o u r a i r q u a l i t y ?



Tom Iraci

THE PUBLIC'S PERCEPTION THAT THE SMOKELESS AIR IT VALUES SO MUCH IS PART OF THE NATURAL CONDITION IS MOST LIKELY ERRONEOUS. TURN-OF-THE-CENTURY SURVEYORS RECORDED DAYS OF PADDLING THROUGH HEAVY SMOKE IN THE GREAT LAKES REGION. MYRIAD JOURNALS KEPT BY OREGON TRAIL PIONEERS ALSO DOCUMENT THE SMOKE AND HAZE HANGING OVER THE WESTERN LANDSCAPE. FIRE—AND ITS ATTENDANT SMOKE—HAS BEEN WITH THIS PLANET FROM THE BEGINNING.

Prescribed fires, on the other hand, can be ignited when weather and fuel conditions allow for minimized smoke impacts on the public's air quality. At the same time, these prescribed fires can decrease the increasing threats that large wildfires pose to our air quality and public health.

Certainly, one of the most effective ways to reduce adverse effects of wildfires is to reduce their intensity. This can be accomplished by reducing the amount of material available to burn, and by selecting the optimum time to burn.

A study on national forest land in northeastern Oregon is producing encouraging results. "Our computer model is looking for a minimum emissions level," explains Ken Snell. "Obviously, the more acres you treat with prescribed fire, the more emissions you get. The net effect on wildfire, though, is that less fuel is available to burn. Therefore, when it does burn, there will be fewer emissions."

m e e t i n g t h e c h a l l e n g e

Today, the Forest Service's fire management program is an integral part of ecosystem management.

For a successful bridge to the future, fire management must continue to develop and integrate focused cost-effective fire prevention, fire suppression, and prescribed fire strategies in a safe and effective manner.

We must also ensure that a successful integration of these three efforts concentrates on ecosystems, supports forest health objectives, and protects and enhances our Nation's natural resources.



"WE MUST BE REALISTIC ABOUT OUR ABILITIES TO FIGHT SEVERE WILDFIRE. AS NATURAL RESOURCE MANAGERS WE MUST MAKE PRUDENT DECISIONS BASED ON SOUND ASSESSMENTS OF ALL THE RISKS. GOOD MANAGEMENT REDUCES THE LIKELIHOOD OF CATASTROPHIC FIRE BY INVESTING IN RISK-REDUCTION MEASURES. GOOD MANAGEMENT ALSO RECOGNIZES WHEN NATURE MUST TAKE ITS COURSE."



Ron Nichols

We need wildland fire to maintain and enhance resources, to function in its natural role, and to serve as an essential ecological process.

But no matter what we do, the health of our forests and rangelands will not be restored overnight. Our present forest health dilemma took a century or more to develop. Many believe it will take decades to restore.

This use of fire to sustain ecosystem health should always be based on sound scientific principles balanced with other societal goals—including public health and safety, air quality, and various environmental concerns.

Because the forest and rangeland health problem transcends property boundaries, we also need strong cooperation between various government agencies, private companies, and the public.

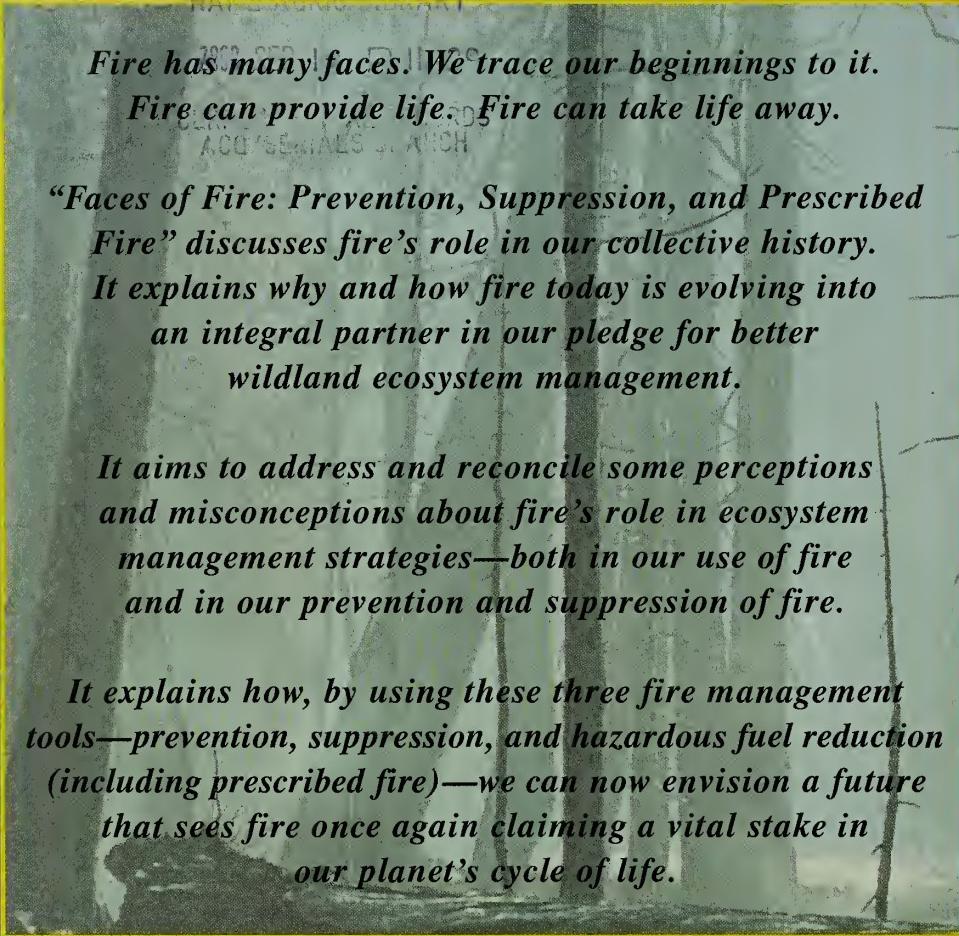
Furthermore, to restore and maintain sustainable ecosystems, fire management goals and objectives—including the reintroduction of fire—must be incorporated on a landscape scale.

In conclusion, we must continue to strengthen the concept of total fire management by increasing prescribed burning while continuing to maintain and utilize our strong fire prevention and suppression capabilities.



Ron Nichols

It is a challenge, like all others that have confronted the Forest Service family in the past, that we have pledged to meet. The safe and effective use of fire through these three faces of fire, today and on into the 21st century.



RAY RAY
ACOY SEENES J. WANCH

Fire has many faces. We trace our beginnings to it.

Fire can provide life. Fire can take life away.

"Faces of Fire: Prevention, Suppression, and Prescribed Fire" discusses fire's role in our collective history. It explains why and how fire today is evolving into an integral partner in our pledge for better wildland ecosystem management.

It aims to address and reconcile some perceptions and misconceptions about fire's role in ecosystem management strategies—both in our use of fire and in our prevention and suppression of fire.

It explains how, by using these three fire management tools—prevention, suppression, and hazardous fuel reduction (including prescribed fire)—we can now envision a future that sees fire once again claiming a vital stake in our planet's cycle of life.



U.S. DEPARTMENT
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FOREST
SERVICE

FIRE AND AVIATION
MANAGEMENT

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